

AMENDMENTS TO THE CLAIMS:

1. (Currently Amended) A semiconductor device, comprising:

a semiconductor chip;

a chip-mounting substrate which is provided with said semiconductor chip mounted on a top surface thereof and first conductive pads formed on a bottom surface thereof and connected with said semiconductor chip electrically;

solder balls formed on said first conductive pads;

a printed circuit board on which second conductive pads connected with said solder balls are formed;

a solder mask formed on a bottom surface of said chip-mounting substrate, said solder mask ~~having an~~ comprising a first uneven roughness; and

underfill material injected into a clearance formed between said chip-mounting substrate and said printed circuit board,

wherein said first uneven roughness is formed on a surface which is brought into contact with said underfill material ~~of~~,

~~wherein said uneven roughness exists on said bottom surface of said chip-mounting substrate and,~~

wherein said first uneven roughness ~~on said bottom surface~~ increases an area of a contact surface between said chip-mounting substrate and the underfill material, and

wherein at least one of said first conductive pads and said second conductive pads comprises a second uneven roughness.

2. (Canceled)

3. (Currently Amended) A semiconductor device according to claim 1, wherein said first uneven roughness is shaped into at least one of a slit-like configuration and a dimple-like configuration.

4. (Previously Presented) A semiconductor device, comprising:

a semiconductor chip;

a lead frame which is provided with said semiconductor chip mounted thereon and electrically connected with said semiconductor chip; and

a printed circuit board including conductive pads which are formed thereon and brought into direct contact with a bottom surface of said lead frame,

wherein said uneven roughness exists on said bottom surface of said lead frame and a surface of said conductive pads.

5-15 (Canceled)

16. (Previously Presented) The semiconductor device according to claim 1, wherein said printed circuit board has a dimple-like shaped configuration.

17. (Previously Presented) The semiconductor device according to claim 1, wherein a surface of said chip-mounting substrate has a slit-like shaped configuration.

18. (Currently Amended) The semiconductor device according to claim 4, wherein said lead frame comprises a lead, said lead comprises an inner lead portion connected to an outer lead

portion, and said outer lead portion comprises said uneven roughness.

19. (Previously Presented) The semiconductor device according to claim 4, wherein said uneven roughness exists on contact surfaces between a pad of said printed circuit board and an outer lead of said lead frame.

20. (Currently Amended) A semiconductor device, comprising:

a semiconductor chip;

a chip-mounting substrate which is provided with said semiconductor chip mounted on a top surface thereof and first conductive pads formed on a bottom surface thereof and connected with said semiconductor chip electrically, said chip-mounting substrate including Cu wirings;

solder balls formed on said first conductive pads;

a printed circuit board on which second conductive pads connected with said solder balls are formed; and

material injected into a clearance formed between said chip-mounting substrate and said printed circuit board,

wherein a first uneven roughness is formed on a contact surface between said Cu wirings of said chip-mounting substrate and said solder balls, and

wherein said first uneven roughness exists on a bottom surface of said Cu wirings, and said Cu wirings are directly connected to said solder balls to form a joined surface, and

wherein said second conductive pads comprise a second uneven roughness portion in contact with said solder balls.

21. (Currently Amended) The semiconductor device according to claim 1, wherein said first uneven roughness is continuously formed on said solder mask.

22. (Previously Presented) The semiconductor device according to claim 4, wherein said lead frame comprises a lead, said lead comprises said bottom surface.

23. (Currently Amended) The semiconductor device according to claim 20, wherein said first uneven roughness is continuously formed on said bottom surface of said Cu wiring.